REMARKS

Reexamination and reconsideration of the application as amended are requested. Support for listing examples of vehicle control systems is found in the specification, page 7, lines 10-13.

The Examiner's rejection of claims 1, 4-6, 8-10, 12-14, 17, 18 and 20 as being "anticipated", under 35 U.S.C. 102, is respectfully traversed. The Examiner rejects these claims as being unpatentable over Hilby '747. Hilby discloses a wheel speed sensor 50 which measures the rotational speed of the rotatable section 30 of a bearing 12 relative to the non-rotatable section 20 of the bearing 12, wherein the sensor 50 is mounted to the non-rotatable section 20, and wherein the sensor 50 senses the rotation of the rotatable section 30.

Regarding claims 1, 6 and 12, the Examiner alleges that the sensor has an output used for determining a force applied to the rotatable section citing columns 3 and 4, lines 7-26 and 3-6 and citing figure 1. Applicants respectfully disagree. Nothing in columns 3 and 4, lines 7-26 and 3-6 and in figure 1 teaches, suggests or describes that the sensor has an output used for determining a force applied to the rotatable section.

Column 3, lines 44-51 of Hilby state, "The bearing assembly of FIG. 3 has a unique configuration for holding sensor assembly 50 and encoder 60 in axial alignment so as to produce a speed signal proportional to the speed of a rotatable shaft (not shown) connected to rotatable inner race 30. Since encoder 60 is nonrotatably mounted on inner race 30, the rotational speed of encoder 60 is equal to the rotational speed of the shaft (e.g., an automobile wheel axle)." It is clear that the output of sensor 50 is used for determining the rotational speed of the rotatable section 30 of the bearing 12. The determination of a rotatable speed of a rotatable section of a bearing is not the determination of a force applied to the rotatable section of a bearing as required by all of Applicants' claims. Page 11, line 22 to page 12, line 9 of the specification disclose a method of Applicants' invention including step b) of determining at least one component of a force applied to the rotatable section from the output of the attached at-least-one sensor. Immediately thereafter, in lines 10-11 of page 12, Applicants note that "in some applications, the vehicle is controlled based also on other inputs such as ... wheel speeds". Determining a wheel speed (i.e., a rotational speed) of the rotatable section is not determining at

least one component of a force applied to the rotatable section as required by all of Applicants' claims.

It is noted that the wheel speed sensor 50 of Hilby does not measure the distance between the non-rotatable and rotatable sections of the bearing as required by Applicants' claims 6 and 12-14.

Regarding claim 4, the Examiner alleges that the sensor 50 includes a stress based load sensor citing column 3, lines 38-42. Applicants respectfully disagree. Hilby describes gear-tooth or Hall-effect sensor types in column 3, lines 38-42. These sensor types are not stress based load sensors such as strain gauges or piezoelectric materials (see column 8, lines 14-16 of the specification).

Regarding claims 5 and 8, the Examiner alleges that the sensor 50 senses the passage of the rolling elements 40 around the raceway past the sensor citing column 3, lines 64-68. Applicants respectfully disagree. The bearing of Hilby does include rolling elements (as cited in column 3, lines 64-68), but the sensor of Hilby senses the rotation of the rotatable section (such as the rotation of the teeth of the rotatable section) of the bearing and not the rotation of the rolling elements which are disposed between the rotatable and non-rotatable sections of the bearing. Clearly Figure 1 shows that the sensor 50 cannot sense any rotation of any rolling element 40. It is noted that, in one implementation of Applicant's invention, the speed of the rolling elements together with the wheel speed determined by a conventional wheel speed sensor are used to determine the orientation of the line of contact of the rolling elements with the races and thereafter the force applied to the rotatable section is determined from such orientation (see column 11, lines 9-18 of the specification).

Regarding claims 9 and 10, the Examiner alleges the sensor 50 is attached to the rotatable race 30 citing Figure 1. Applicants respectfully disagree. Figure 1 clearly shows sensor 50 attached to the non-rotatable race 20 and not to the rotatable race 30.

Regarding claims 13, 14, 17 and 18, the Examiner alleges that the non-rotatable race includes a hub and the sensor is attached to the hub. Applicants agree. The Examiner cites

column 4, lines 8-10 for support. Applicants disagree that column 4, lines 8-10 support the Examiner's conclusions and suggest using figure 1 of Hilby to show that the sensor 50 is attached to the hub.

Regarding claim 20, the Examiner alleges that a controller is used for controlling the vehicle based in apart on the determined component citing column 3, lines 51-55. Applicants respectfully disagree. Hilby does disclose a microprocessor/controller (presumably for an anti-lock braking system (see column 1, line 28 of Hilby) which uses rotational wheel speed as an input, but such rotational wheel speed is not a determined component of force as required by claim 20. As previously mentioned, a force component and a rotational wheel speed can both be used to control a vehicle, but Hilby is only determining a rotational wheel speed and is not determining a force component.

The Examiner's rejection of claims 2, 3, 7, 11, 15, 16, 19 and 21 as "obvious", under 35 U.S.C. 103, is respectfully traversed. The Examiner rejects these claims as being unpatentable over Hilby in view of French '962. Applicants previous remarks concerning the patentability of all of the claims over Hilby are herein incorporated by reference. The Examiner alleges that French discloses sensors whose outputs are provided to a vehicle control system citing columns 3, 5, 6 and 7, lines 63-65, 33-67, 1-9 and 58-61.

French uses sensors such as a rotational speed sensor 110 whose signal reflects angular (rotational) velocity (see column 5, lines 53-55), a temperature sensor 112 used to determine temperature, and an acceleration sensor 114 used to determine vibration. French uses such sensor outputs to determine the operating condition of the bearing in real time and to further evaluate the physical condition or "health" of the bearing and most importantly to recognize an imminent failure before it actually occurs and results in significant damage to the bearing and related components (see column 7, lines 22-50 of French). The only sensor output of French which is also provided to a vehicle control system is the output of the rotational speed sensor 110 provided to an antilock braking system (see column 7, lines 59-62). However, such rotational speed sensor 110 output is used to determine a rotational speed of a rotatable section of a bearing and is not used to determine at least one component of a force applied to the rotatable section of

the bearing as required by all of Applicants' claims. As previously mentioned, a force component and a rotational wheel speed can both be used to control a vehicle, but French is only using a rotational wheel speed to control a vehicle.

Inasmuch as each of the rejections has been answered by the above remarks and amended claims, it is respectfully requested that the rejections be withdrawn, and that this application be passed to issue.

Respectfully submitted,

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